SEPTEMBER 5, 1983
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NEWS

New BASF chief faces tough recovery road
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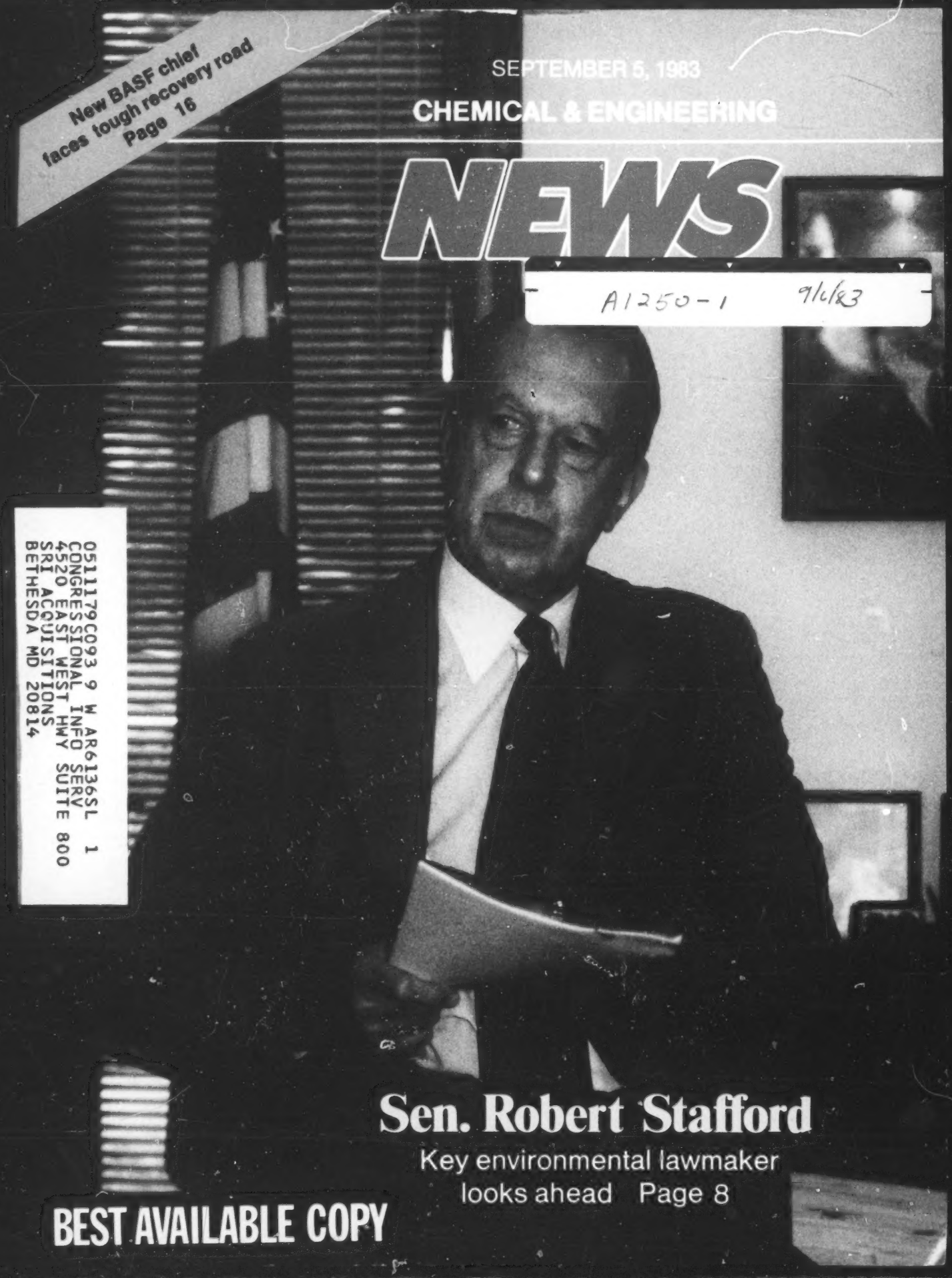

Sen. Robert Stafford

Key environmental lawmaker looks ahead Page 8

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News of the Week

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■ **ACS annual meeting draws 13,000; more than 3500 technical papers presented.** **Page 5**

■ **Research on enzyme inhibitors may lead to better drugs for diabetics.** **Page 5**

■ **Events of ACS annual meeting in Washington, D.C., as seen by a photographer.** **Page 6**

■ **EPA survey shows previous estimates of hazardous wastes generated in U.S. were much below actual levels.** **Page 7**

■ **El Paso Products Co. will cut its chemicals workforce 25%.** **Page 7**

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Science

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Computer Services Evolving For Chemical Managers

Advent of the small computer reduces the need for time-sharing, alters the mix of computer services bought by chemical firms

David Webber, C&EN New York

Not very long ago at all, the computer meant just one thing: the mainframe—the massive data processing unit that ushered in the computer age. But even as mainframes grew larger and more powerful, computer evolution branched off into a line of small processors—minicomputers, personal computers, and home computers. As the capabilities of the smaller units expanded, experts began to predict the eventual demise of the mainframe, seeing the aboriginal form as a sort of oversized dinosaur in a new era belonging to the compact. Small computers, some said, would crunch numbers as well as the dinosaurs did, occupying a mere desktop instead of an entire climate-controlled room while they were doing it.

For chemical industry executives working in market research, financial planning, and other managerial positions, the burgeoning of the small computer has indeed increased both speed—as the need to queue up for time on the corporate mainframe is reduced—and control—as the ability to manipulate data on the desktop processor expands. At the same time, however, the mainframe, with its far greater capacity, has not disappeared. Nor do the most recent studies any longer forecast its extinction. What is occurring instead is a shift in the mix of computer-related services that executives can purchase from outside vendors—a shift that companies think will more efficiently exploit the most advantageous aspects of the great capacity of the mainframe and the intimacy of the small computer.

For a long time, chemical market researchers and financial planners have been able to draw on the resources of outside computer service firms for a multitude of services. These include access to numerical databases: files of statistics on production, capacity, imports, exports, and the like, to "supermarket" information services like Lockheed's DIALOG and SDC ORBIT, and to specialized data banks like those operated by the *New York Times* (soon to be removed from public access), Dow-Jones Co., patent databases, health and environmental data-bases, various government databases, and others.

Up until now, if a chemical manager wanted to generate market or financial forecasts, he or she could pull data from these sources and, using an in-house mainframe computer, run "what if" calculations on a spreadsheet program. But this system had its drawbacks: It could take lots of time and, often, the complex work could be performed better by a computer firm specializing in the chemical industry, which had highly involved models for just that purpose already prepared.

On the other hand, having an outside firm do all the calculations, rather than just the extremely complex ones for which it was best suited, could get very expensive. In budget-conscious times, the specter of high time charges for computer use could be inhibiting to an executive who, with just a few more calculations, might reach an important conclusion.

Now, computer service firms that specialize in the chemical industry —such as Data Resources Inc. (DRI) of Lexington, Mass., Sage Data Inc. of Princeton, N.J., and Chase Econometrics of Bala Cynwyd, Pa.—are finding that as the processing sophistication of their customers rises, the relative importance of time-sharing—the traditional computer service, in which the use of a firm's databases and data processing is billed on a fee-per-minute basis—is shrinking. The dynamic of the business has shifted, instead, to programs and customized services that make it possible for customers to use computers more cheaply, with greater flexibility, and with less re-

Computer services boom to continue, but more slowly

$ Millions	1967	1981	1985[a]	1995[a]	Annual growth, % 1967–81	1981–85[a]	1985–95[a]
Computer services	**$1010**	**$18,660**	**$36,600**	**$100,000**	**23.2%**	**18.3%**	**10.6%**
Processing services	720	9,140	15,400	33,000	19.9	13.9	7.9
Professional services	65	3,640	7,900	25,000	33.3	21.4	12.2
Packaged software	210	3,920	8,200	23,000	23.2	20.3	10.9
Turnkey systems	15	1,960	5,100	19,000	41.6	27.0	14.1
Computer shipments	**5530**	**15,200**	**24,700**	**40,300**	**7.5**	**12.9**	**5.0**

a Forecast. Source: Predicasts

liance on both external and in-house staff support.

"In a sense, the time-sharing side of the business is declining because of the onrush of minicomputers, superminicomputers, and PCs [personal computers]," says Ronald M. Whitfield, DRI's vice president, chemicals practice. "What is growing now is specialized software."

The reason is the increasing demand for speedy, flexible ways to transfer or "download" data from a mainframe to a small computer. Until fairly recently, programs that could transfer data and enable customers to create, for instance, business graphics other than in an on-line (pay-by-the-minute) mode were scarce. Now this software, such as DRI's DRILink and Sage's SAGEPC, can link the big data processing capacity of the database company's mainframes with the spreadsheet and graphing abilities of the customer's small computer.

"It's almost the perfect situation for the consumer," comments DRI's Whitfield. "You can look at the menu of items you need to do—say, forecasting and analysis—and you can do a little on DRI's mainframe, then download to your own mini or PC. Then you can access as well to your in-house mainframe for internal information."

"What's also coming on strong is microplotting," says Peter P. Pranis Jr., senior consultant at Probe Economics, Mt. Kisco, N.Y., the chemical industry forecasting and consulting arm of Sage Data. "Say you want to run multiple plots for a business graph. You run mainframe information from, say, Sage, into your PC and put it on a disk, then add it to your plotter."

The result is a graph built on the huge data processing capacity of the mainframe, but generated in the customer's personal computer, which would have neither enough capacity nor in most cases sophisticated enough modeling equations alone to perform the complex calculations done in the outside firm's mainframe. The data can be manipulated by the chemical manager personally without the pressure of mounting on-line charges.

This shift in the relationship between the mainframe and the small computer comes at a time when demand for U.S. computer services is expected to grow fivefold between now and the mid-1990s, according to a study published earlier this year by Predicasts Inc., the Cleveland-based business information and market research house. According to Predicasts, there will be a substantial alteration in market share among the various categories of computer services, which, as a whole, will grow much faster than computer equipment shipments.

Data processing, whose main business outlet is time-sharing, will continue to dominate the service industry, its revenues climbing at a 13.9% annual rate between 1981 and 1985 to $15.4 billion. During the same period, however, professional services—assistance in more complex processing operations—will boom. Growth will amount to more than 21% per year, reaching $8.2 billion in 1985. The other, somewhat smaller, service areas—packaged software and turnkey systems—also will grow rapidly, at annual rates of 20.3% and 27.0% between 1981 and 1985, respectively.

As a result, the share of the market held by data processing will shrink from 71% in 1981 to 42% in 1985. By 1995, Predicasts says, the reconfiguration of market share will be even more pronounced: Data processing revenues will account for just 33% of the service segment, whereas professional services' share will have risen to 25%, packaged software's to 23%, and turnkey systems' to 19% of an overall $100 billion business.

Computer service companies are scrambling now to adjust to the changes as they occur. As time-sharing declines in relative importance, service firms will beef up their software development and professional services operations. Consulting in the form of data analysis and forecasting, already integral aspects of the business, will become even more important and more service oriented.

"As far as the forecasting business goes," comments DRI's Whitfield, "customers will still prefer us to do it for them, but they will want us to make it easier for them to understand. They will want more 'what ifs', more ranges in the forecasts."

On the plus side, the new interface software makes it possible for small companies, which could not afford to use on-line services, to link up with the computer service companies. "We're getting calls now from companies that couldn't use us before, but now we're breaking data down into such small chunks, a little plastics manufacturer could use us," points out Whitfield. "We are now coming across on the kind of little machine it can afford to buy." □

With personal computers such as Cromemco's new C-10 desktop unit, executives can tap into the processing power of the mainframes